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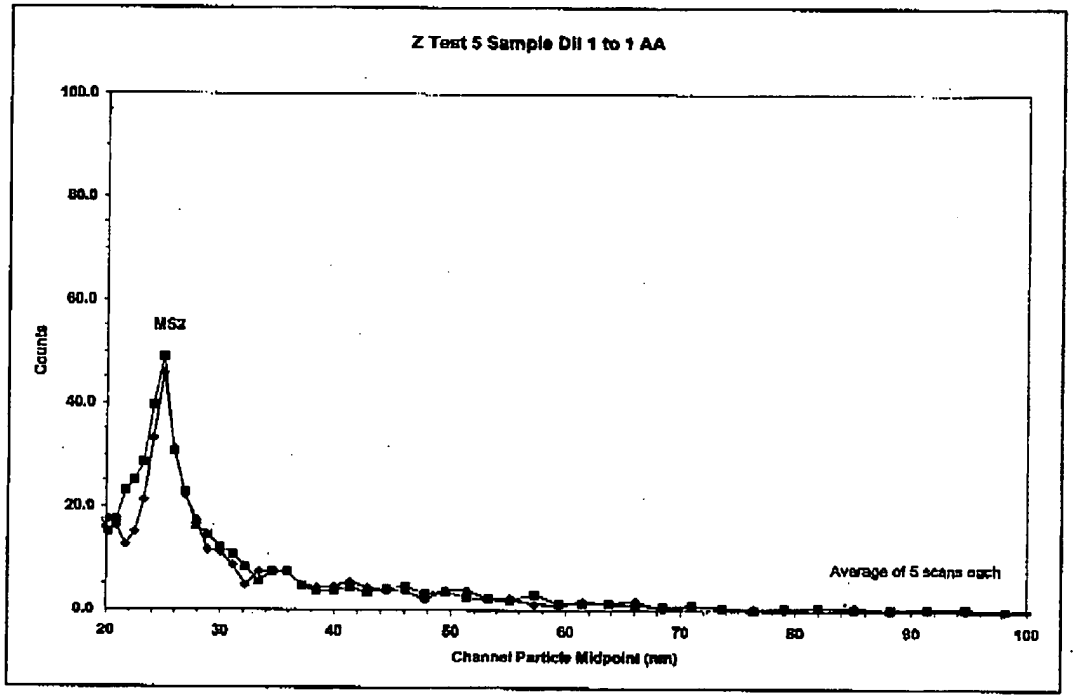
The few 1-micron particles shown in Fig. 3 may have been either residual droplets or solid residues from not perfectly pure water, which may explain the observed increases in the numbers of these particles as the nebulizer content was going down from 5 ml to 1.4 ml.

Test Results

The collection efficiency for MS-2 was then tested with an Integrated Virus Detection System (IVDS) comprising a virus particle imager and counter developed at the US Army's Edgewood Chemical Biological Center.[v]

The first test yielded a count of 1,000 particles 24.1 nanometers in size in a 50-nanoliter sample, corresponding to a collection efficiency of >15%. Subsequent tests yielded efficiencies ranging from ≈30% to >90%. The full data for the last of these tests are presented as follows:

Fig. 4



IVDS analysis of Test 5 sample after dilution of 1:1 with 20 mM ammonium acetate -- MS2 detected

Assumption: time progresses linear with channel midpoint				
Capillary flow 80 nl/min (previous capillary flow analysis, Aug 2004)				
80 nl/60 s = 1.3 nl/s				
and 120 channels in 60 s = 0.5 s/channel				
4 s x 1.3 nl/s = 5.2 nl				
ROI counts 97/5.2E-6 ml = 1.9E7/ml				
Concentration factor of 2 = 3.8E7/ml				

IVDS analysis of stock sample = ~$2x10^9$ counts/ml
Volume dispersed: 5 ml
Collection Time: 8:08 minutes
Sample collected: 60 ml

Collection Efficiency ≈
80 ml x $3.8x10^7$ (counts/ml)/[5 ml x 2 x 10^9 counts/ml] ≈ 30%

Average phage concentration in sampled air ≈
5 ml x 2 x 10^9 counts/ml/[8.1 min x 500 L//min] ≈ 2.5 x 10^6 counts/L

Conclusions

The demonstrated detection sensitivity may be improved more than 100-fold by subjecting the collected liquid volume to centrifugation or ultra-filtration so as to reduce it to <1 ml.

Further tests are called for to evaluate possible applications in timely discovery of pandemic infections in work places, employee cafeterias, airplanes, cruise ships, and other frequented facilities or places.

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CERTIFICATION OF FAXING

The undersigned hereby certifies that this response is about to be transmitted to fax number 571-273-8300 on or about April 24, 2009.

Solomon Zaromb